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L'auteur fait d'abord l'historique du projet SAGE (Système d'apprentissage géré par l'étudiant) et répond aux questions suivantes: de qui provient cette innovation? pourquoi a-t-elle commencé? Il décrit ensuite le plan général qui a été suivi pour évaluer l'utilisation de ce système dans des écoles expérimentales. L'évaluation fut faite sous la conduite de l'INRS-Education pendant une période de cinq ans (1974-1979). Le plan d'évaluation était simple: on testait huit hypothèses avec des groupes expérimentaux et des groupes de contrôle. Le principal objectif du projet était le développement d'un système de gestion pédagogique qui donnerait aux élèves plus de responsabilité dans leurs activités d'apprentissage et un comportement plus autonome en classe.

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by

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In this exposé, I would like first to provide an answer to the fundamental question of the origin of "Projet SAGE". "Whose innovation is it"?[1] Why was it started? Secondly, I shall describe the general plan that was followed to evaluate the use of the system in the experimental schools.

From 1956 to 1959, I worked as a secondary school teacher in northern Ontario. During those years, I was very much impressed by the fact that it was almost impossible for me to teach successfully to the majority of my students. The students who entered my class with good grades would continue to do so. Those who had performed poorly until then would continue to live a very risky life in the school system. It seemed to me that my performance as a teacher did not matter very much for the destiny of my students. I felt that the relationship between my effort to help my students and their level of success at the end of the school year was almost non-existent.

There was not much that I could do to change that state of affair during those years. But I kept telling myself that there had to be a way to change things in the classroom. When I left teaching to go back to studies, I was hoping that some day somehow I could bring a contribution to the solution of that problem.

A decade later, as I was attending the annual meeting of the American Psychological Association, I was very much impressed by a paper presented by John Flanagan on individualized instruction.

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1 Flores, Pedro V. *Educational Innovation in the Philippines: A Case Study of Project Impact.* A publication of the International Development Research Center, Ottawa, 81 pages, 1981, page 5.

John Flanagan explained the rationale of project PLAN (Program for Learning in Accordance with Needs) that he had initiated at American Institutes for Research.

Project PLAN[2] was an individualized system of instruction for the elementary and the secondary schools. Its aim was to help the student to participate more fully to the planning and to the management of his classroom life. John Flanagan felt that the ability of the student to manage his classroom life was a prerequisite to a successful career in later life. His research had convinced him that the school system did not pay enough attention to this very basic need. From his point of view, too many secondary school students were unable to make adequate planning for their future life.

I became convinced that Project PLAN was offering a model of classroom organization that could be helpful in the province of Quebec, but I had to wait a few years before I could enact the idea in my own country.

In the meantime, I became familiar with the educational policy of the Ministry of Education concerning "le progrès continu", a policy designed to allow students to make progress in a continuous manner, at all times and in every situation. In other words, I disovered that the Ministry of Education of Quebec was defining as an important objective of its action the suppression of barriers to progress in learning for

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1 Flanagan, John C., The role of the computer in PLAN. *Journal of Educational Data Processing*, 1970, 7(1), 7-17.

This policy was already well formulated in the province of Quebec at the beginning of the seventies. In 1971, it was inserted in the official regulations of the Ministry of Education.

Here is the statement that is found in Regulation number 7, article 11[3]:

> "The organization of these (learning) activities must take into account individual characteristics of students and allow for the possibility of continuous progress in the pursuit of teaching objectives at the kindergarden and elementary levels, as defined in the official programs".

One must realize that regulation number 7 made it mandatory for school teachers to individualize their teaching in a very intensive way. It was easy for them to agree with the Regulation from a theoretical standpoint. However the Ministry of Education made no special plans to provide the means necessary to enact a regulation of that nature. The school personnel was left to its own initiative and resources all over the province.

In 1972, I felt that a group of researchers could help fill the gap between the end and the means of individualized instruction in Quebec. So, I decided to write a proposal along that line and I presented it to the Director of "l'Institut National de la Recherche Scientifique" (INRS), Mr. Charles Beaulieu.

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3 Règlement numéro 7, du Ministère de l'Education. Ministère de l'Education, 1972. "L'organisation de ces activités doit respecter les caractéristiques individuelles des élèves et permettre leur progrès continu dans la poursuite des objectifs de l'enseignement, à la maternelle et au niveau élémentaire, tels qu'ils sont définis dans les programmes officiels". English translation by the author.

This proposal was extremely concise. There was no extensive survey of the research literature in it. I honestly think that it would not have been approved by any serious granting agency in Canada. However, Mr. Charles E. Beaulieu, the founder of our National Institute, was a daring leader and a man of vision. He approved whole-heartedly of the idea, probably because it was the kind of research and development program that he was looking for in order to establish a research center in education within the Institute that he was directing. As a matter of fact, "Projet SAGE" was to become the main research program of the center during the five following years (1973-1977). The center was under the direction of Gilles Dussault during those years, who was fully committed to the success of that research program.

The objectives of the project were the following. First, to promote the evolution of the school system by providing the tools and the management system for individualized instruction.

Secondly, to evaluate the effects of the system on students, teachers and the school environment.

Thirdly, to use learning activities as the principal means in order to develop autonomous and responsible behavior among all actors in the classroom.

After its approval by the board of administration of INRS in 1972, the project was presented to the Deputy-Minister of the Ministry of Education of Quebec. Mr. Beaulieu saw to it that the deputy-minister would pay attention to the project.

A committee was formed by the Ministry of Education in December 1972 to study the project. Three months later, the

eight-member committee unanimously recommended the realization of the project, because it was related to the priorities of the Ministry of Education and because it was an appropriate answer to a need felt by the schools[4].

The recommendation of the committee was well received at the Ministry of Education. In the fall of the same year (1973), the deputy-minister established a steering committee for "Projet SAGE". This committee held regular meetings from 1973 to 1977. It presided over the orientation of the project during those critical years. Without its contributions and support, the small group of researchers at INRS-Education would not have succeeded in gathering all the resources that were necessary for the success of the undertaking.

To secure the approval and the support of the Ministry of Education was indeed absolutely necessary for the success of the project. But we needed also the cooperation of the school boards. School boards, in Quebec, are democratic organizations which enjoy a certain level of autonomy from the Ministry of Education. They assume responsibility over teachers and students in public schools.

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4 Avis d'opportunité
"A la suite de ses travaux, le Comité est unanimement favorable à la réalisation du projet SAGE. Ses objectifs s'inscrivent dans les priorités du Ministère au niveau élémentaire et répondent aux attentes du milieu. Le Comité recommande donc aux autorités concernées du Ministère de l'Education de prendre les mesures qui s'imposent, dans les meilleurs délais, pour la mise en marche du projet, après que les modalités auront été spécifiées".

We were fortunate to find a school board near Quebec City that was willing to sign a three-year agreement with INRS for the development, experimentation and evaluation of "Projet SAGE".

This agreement made it possible for the staff of the first experimental school to work in cooperation with our research team. Together, we defined the learning objectives. We experimented the teaching and learning units with their students. Furthermore, we conducted the evaluation of the system with their assistance.

After this historical account of the two first years of "Projet SAGE" (1972-1973), I think it is possible to provide an adequate answer to the question: "Whose innovation is it" Why was it started?

At the end of 1973, three organized bodies (a research institute, the Ministry of Education, a school board representing the school people) had committed themselves firmly in support of the project. However, it sould be clear from what I have said that the project originated from a research body, and not from the Ministry of Education or the school people.

"Projet SAGE" was originally the idea of a group of researchers who agreed between themselves that there was a gap between the educational policy of the Ministry of Education and the means available to the school people to realize that policy. For better of for worse, it is still identified with INRS-Education.

Our group of researchers managed to obtain the cooperation of the school people and of the Ministry of Education in order to fill that gap, until 1977.

However, in 1978, the Ministry of Education became hesitant toward the undertaking and more or less abandoned the research group to their own resources. On the other hand, the school people made pressing demands for the system that our limited capacity of production could not satisfy entirely. Until today, we have not been able to come to ar agreement with anyone of the editors that could have taken the responsibility to produce the system.

The editors are frightened by the huge investment that they would have to make. They are not convinced that individualization will influence the market in any important manner in the coming years. However, there is one exception. "Les Presses de l'Université du Québec" are showing an interest in our product.

The present situation of our research group could be characterized in the following manner. Our clients tell us that we have developed a good product, but we do not seem to find the means to deliver it to those interested. The main reason for this situation is the flight of the Ministry of Education toward other priorities since 1978. The definition of new programs for all school subjects is drawing much of its resources at the present time. For how long? Nobody knows.

In the mean time, our research group is not giving up. We are confident that we will find a solution to our dissemination problems, even if it were to be without the cooperation and resources of the Ministry of Education. The main reason for our optimism is the attitude of the school people who definitely want the product that we have developed. We are determined that they will have the last word in that adventure. INRS has been created in order to make available to the people the advantages that could be derived from research. We shall continue to pursue the goal of our Institute.

THE EVALUATION SCHEME

I now come to the question of evaluation. There have been many kinds of evaluation of "projet SAGE" during the 9 years of its life. I shall mention only a few of them: the evaluation of the drafts of the first teaching learning units by a visiting scholar, Dr. Horacio Rimoldi; independent evaluations done by the first school boards that invested their resources in the experiment; evaluation by the mass media, etc. In this exposé, I shall talk only of the evaluation study conducted by INRS-Education with the cooperation of the two experimental schools.

The study was conducted during a five-year period (1974-1979). It began when the teaching learning units were used for the first time in the first experimental school on a regular basis (September 1974).

The evaluation plan was very simple. We followed the basic model of testing hypotheses with experimental and control groups. The main objective of the project was the development of a classroom management system that would allow the students to take more responsibility in their learning activities and to develop a more autonomous behavior in the classroom situation.

Through the eight hypotheses that we selected, we were trying to see if that basic objective was reached, at least to some extent.

The 8 hypotheses are the following:

Hypothesis 1

Students in "Projet SAGE" shall develop certain fundamental reasoning capacities as well as students in regular classrooms.

Hypothesis 2

Students in "Projet SAGE" shall learn what is taught in an individualized manner as well as students taught in the regular manner in control classrooms.

Hypothesis 3

Students in "Projet SAGE" shall develop a higher self-esteem than children in regular classroom.

Hypothesis 4

Students in "Projet SAGE" shall show less anxiety than students in regular classrooms.

Hypothesis 5

Students shall show more appreciation of school topics taught in an individualized manner, as compared to students taught the same topics in a regular manner.

Hypothesis 6

Students in "Projet SAGE" shall have more opportunities to assume responsibility for their learning than students in regular classrooms.

Hypothesis 7

Teachers in "Projet SAGE" shall take less time teaching to their classroom as a whole, and more time to take care of individuals or small groups, as compared to teachers in regular classrooms.

Hypothesis 8

a) In taking care of individuals or small groups, the teacher's most important tasks will be:

- guiding and giving orientations to students
- encouraging those whose motivation is low
- verifying students progress in learning
- solving communication problems among students

b) Teaching content will become a secondary task as compared to the tasks listed above.

Here again, the behavior of teachers in SAGE classrooms was to be compared with the behavior of teachers in regular classrooms.

The testing of the last three hypotheses (hypotheses 6 to 8) required the observation of the behavior of students and teachers. That investigation was conducted by Mariel Leclerc. He will

explain to you in the following presentation how that was accomplished. Consequently, I will restrict my comments to the testing of the first five hypotheses.

The first two hypotheses had to do with intellectual functioning and learning achievement. During those years, the main topic whose teaching was individualized in a systematic manner was French as a first language. We used the instruments developed by the Ministry of Education to measure intellectual fuctioning and achievement in French in the experimental and control groups. In general, we found that the hypotheses were confirmed. There was no impairment in the experimental groups as compared to the control groups.

Testing those two hypotheses was very important for ethical reasons. We felt we had the moral obligation to show that the normal development of the students was not disturbed because of their participation to the experiment. We think that "Projet SAGE" permits better learning in French. However, it is not easy to demonstrate it objectively during the experimental phase of a system like ours. It was a wise decision not to pretend that individualized education could do better during those years, because we would not have been able to demonstrate that fact.

The third hypothesis was more pretentious. We thought that our students would show a higher self-esteem. We used one scale of Coopersmith's Self-esteem Inventory[5]. The hypothesis was verified only one out of 5 years of measurement. We now recognize that the hypothesis postulated an effect that is out of proportion with the experiment itself.

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5 Coopersmith, S. *The antecedents of self-esteem*. San Francisco, Freeman, W.H. and Co., 1967.

It would have been more relevant to measure the self-concept of ability toward school tasks or the academic self-concept in a manner similar to what Brookover[6] has done. It was too late when we realized our error.

The fourth hypothesis was concerned with anxiety. We assumed that anxiety as measured by two instruments developed by Sarason[7], would be less high in the experimental group. Again, this hypothesis was unrealistic, eventhough it was confirmed a few times. It would have been sufficient to expect that the experiment would not generate in the students more anxiety than is generally found in the classroom. This fact was clearly demonstrated.

We considered that demonstration to be a very important finding in view of the fact that the system increases so much the responsibility of the students in the classroom. Furthermore, the system relies very much on the use of evaluative instruments in the daily life of the classroom. These instruments could have been perceived by the students as a continuing threat. On the contrary, it seems that the students were pleased to be given clear rules of conduct for learning and for evaluation. Clear rules of functioning in the classroom is something that children expect. It is not a cause of fear or anxiety, unless those rules become too rigid or discriminatory.

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6 Brookover, Wilbur G and Thomas Shailer, Self-concept of ability and school achievement. *Sociology of Education*, V. 37, 1964, pp. 271-278.

7 Sarason, S.B. et al. *Anxiety in elementary school children*. New York: John Wiley and Sons, 1960.

The fifth hypothesis postulated that children would show more liking for school subjects presented in an individualized way, than for the same subjects taught the regular way. This hypothesis was measured with an instrument constructed in our center. In its final form, it consisted in presenting to the children scales graduated from 1 to 9 and asking them to rate on these scales everyone of the school subjects that were taught in their classroom. The results were very clearly and very consistently over the years in favor of the experimental groups. Whereas the learning of the mother tongue had a very low status in the control groups, it was one of the most liked school subject in the experimental groups. This finding is one of the most important of our study. It shows clearly, I think, that the individualization of instruction can easily increase the interest and the motivation of students of these age groups, if it is conducted in a systematic manner and with tools that can be put under the control of the students.

I have described in a very schematic manner the basic design of our evaluation study of "Projet SAGE", to the exclusion of our studies based on observation. Many important additions and modifications were made to this plan, especially during the fourth year of the study. Time does not allow me to describe those changes.

The basic weakness of that plan, according to me, was the excessive importance given to the preconceptions of the researcher or principal evaluator. The identification of the criteria that should be used to evaluate an educational innovation of that nature should not be left to the authority of the principal evaluator. That is the very important lesson that Jean Cardinet has

taught me in his interesting article published in *Education et Recherche*[8].

According to Jean Cardinet, the role of the evaluation expert should become less authoritarian with regard to the opinions and feelings of all the persons involved in the innovation. His main task should be to discover what are the criteria that the actors are using for their personal evaluation of the innovation. Secondly, he should try to discover if the participants (v.g. students, teachers, parents, research team etc.) are reaching among themselves some kind of consensus on their educational experience.

That is the reason why in the report of the last two years of the evaluation, I have given more importance to the study of the opinions expressed by the school personnel, the students and the parents. Hypothesis testing has been reduced to a secondary role, allthough I continue to consider it an important dimension of evaluation.

One advantage of such a shift in emphasis is that the final product (the evaluation report) appears to be much more meaningful to the persons for whom it has been written.

N.B.: Four annual reports[9] of the evaluation are available in our center. The fifth and last one will be available this summer.

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8 Cardinet, Jean. L'élargissement de l'évaluation. *Bildungsforschung und Bildungs praxis. Education et Recherche*, 1979, Vol. 1, no 1, pp. 15-34.

9 Reports R-085, R-106, R-125, R-136.